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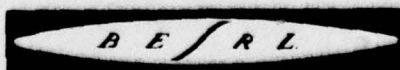
Research Study 69-5

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**SUMMARY OF BESRL RESEARCH ON SCREENING  
AND CLASSIFICATION OF ENLISTED MEN**

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April 1969

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Army Project Number

(16) 2000106A722

Enlisted Manpower Systems,  
Optimum Mental Distribution

(14)

BESRL-Research Study-69-5

(6)

SUMMARY OF BESRL RESEARCH ON SCREENING  
AND CLASSIFICATION OF ENLISTED MEN,

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Apr 1969

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## FOREWORD

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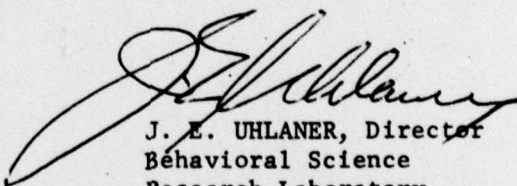
BESRL's Research Area 1, "Personnel Management Research--Selection," includes eight major work units. The present publication summarizes the human factors research on enlisted selection and classification under three of these work units:

Interface between Civilian and Military  
Enlisted Manpower Systems

Differential Classification of Enlisted Manpower

Optimum Distribution of Individual Abilities  
for Unit Effectiveness

Research is conducted under Army RDT&E Project 2Q06106A722, "Selection and Behavioral Evaluation," FY 1969 Work Program. The remainder of the research effort under this Project deals with the evaluation of behavior involving unusual demands upon individuals, groups, or systems. Objectives include junior officer selection for training and differential assignment, identification of combat personnel, and a new official performance evaluation system providing more useful information to Army Personnel Management. Progress on these efforts is the subject of a separate publication.



J. E. UHLANER, Director  
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## SUMMARY OF BESRL RESEARCH ON SCREENING AND CLASSIFICATION OF ENLISTED MEN

### BRIEF

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✓ BESRL's research on the selection and initial classification of enlisted manpower concentrates on three broad problem areas in Army personnel management: screening, differential classification, and utilization of marginal manpower through optimum distribution of individual abilities.

Research on initial screening deals with methods for establishing the mental standards to be used in deciding whether an individual should be accepted for enlistment or induction. Differential classification, which establishes the type or types of Army job for which an individual is suited, poses a different problem in psychological measurement. Whereas screening is essentially a comparison of individuals with respect to general aptitude, the classification procedure adds a set of measures which yield the pattern of aptitudes and abilities within the individual which differentiates him from others. The research objective is to achieve the best basis for matching the aptitudes of incoming enlisted personnel with the Army jobs for which they are to be trained. ✓

A special problem which touches both screening and classification is the effective incorporation of mentally marginal personnel within the Army job structure. Effective personnel management requires that screening standards not be too high (especially during mobilization). Yet many assignments are demanding, and require personnel of superior ability. Responsibilities placed upon some units call into question the proportion of men of marginal ability the units can absorb and still function adequately. BESRL research attacks the problem of how many marginal personnel can be used effectively in which assignments.

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## SUMMARY OF BESRL RESEARCH ON SCREENING AND CLASSIFICATION OF ENLISTED MEN

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### ENLISTED MANPOWER--SCREENING

Research is brought to bear on initial screening in order to measure more effectively the trainability and usability of potential enlisted men. The objective is accomplished by developing and evaluating for operational use new and improved methods of psychological testing and by devising new forms of screening measures. The research and the implementation of the research products are the results of close coordination with the sponsor and user agencies.

### CURRENT OPERATIONAL TESTS

BESRL's past research in this area has resulted in development of a number of operational tests: the Armed Forces Qualification Test (AFQT), the basic screening test specified by act of Congress for determining mental acceptability for all the military services; the Army Qualification Battery (AQB), used by the Army for supplemental screening of marginal preinductees and determining qualification of applicants for enlistment commitment; the Enlistment Screening Test (EST), administered by recruiters to determine likelihood that an applicant will qualify on the AFQT; the Women's Army Classification Battery (WACB) which serves as both screening and classification battery for women; and the Examen Calificación De Fuerzas Armadas (ECFA), used in Puerto Rico as the preinduction screening test for non-English-speaking Puerto Ricans. Continuing research is directed not only at developing new forms of these tests but also at developing new methods of testing to increase the effectiveness of psychological measurement in the utilization of enlisted manpower.

### THE ASVAB

More recently, the ENLISTED MANPOWER Work Unit, responsive to a directive of the Assistant Secretary of Defense (Manpower and Reserve Affairs), has led an interservice research team in developing the Armed Services Vocational Aptitude Battery (ASVAB), currently in use in the Joint High School Recruiting program. The ASVAB is unique in that it was derived from research that identified interchangeable tests of the Army, Navy, and Air Force.

The current ASVAB was intended to be an interim form, one that could be developed as quickly as possible by using available items from the operational service tests. Shortly after completion of the interim ASVAB, work was initiated on the development of new forms. This effort is a longer range one than the original and represents the full cycle of test development: preparation of new test items, administration of experimental tests, item analysis and selection, and standardization.



## SHORT ENLISTMENT SCREENING TEST

The ENLISTED MANPOWER Work Unit has been conducting research on unconventional testing methods. One of these methods is the very short go-no go test. Previous studies, both theoretical and empirical, have indicated that such a short test (8 items) can be as effective as the current conventional long Enlistment Screening Test (48 items) to identify potential applicants who can qualify on the AFQT. An operational form of the short EST has been adopted by the U. S. Army Recruiting Command, along with an AFQT Information Pamphlet developed and tested by the Unit. This pamphlet gives the applicant information on the nature of the AFQT as well as an opportunity to practice on a sample test.

## AUTOMATION OF TESTING

Another form of unconventional method that the Unit has been working with is the programmed test, in particular, a type of test with a branching program instead of the conventional linear program. The branching program permits more individuation of testing by presenting test items according to the examinee's success or failure on the preceding items. The linear program requires all examinees to answer all the items regardless of success or failure on preceding items. Such test programming is made possible by the use of a computer. Although research is still in pilot phase, the computer-assisted testing may have important spin-off for the current DOD interest in the feasibility of automating medical examinations, mental testing, and administrative processing at Armed Forces Examining and Entrance Stations (AFEES).

## ENLISTED MANPOWER--DIFFERENTIAL CLASSIFICATION

The DIFFERENTIAL CLASSIFICATION Work Unit performs research to improve the classification and assignment of the Army enlisted input. This research is focused on finding ways to assess the complexity of human behavior and potential and then to match these characteristics to the diverse and ever-changing demands of Army training and jobs. The men's potential is assessed early in their Army careers before any significant job training has begun. The men are then followed up to determine how well they have succeeded in their job training and on the job itself. Tests that prove to be accurate predictors are retained for further study, and if they are found to be effective in a variety of situations, they are recommended for operational use. Tests that are not related to future performance are discarded. Army classification and assignment, then, is based on a scientifically sound foundation of research data.

## NEW APTITUDE AREAS

As part of the effort to keep abreast of changes in the demands of Army training and jobs, a large scale study of the Army Classification Battery (ACB) has just been completed. Test scores were obtained on about 25,000 men in over 100 different training courses, which covered the entire range of openings available to new enlisted men. The men were followed up during their training and again after they had been on the job for about one year to determine how well they performed. The study resulted in the development of a set of new aptitude areas that improve the classification of the enlisted input. The average validity of the new aptitude areas is .59 as compared to .54 for the measures currently in use. The increase in validity means that the men's potential can be more accurately matched to the demands of the job training, with the result that the number of training failures will be reduced and that the graduates will perform at a higher level.

The increase in the effectiveness of the aptitude areas is obtained by placing greater weight on the tests of general learning ability in the ACB and by increasing the number of tests in each aptitude area. Whereas the present areas are each based on two tests and the tests of specialized knowledge and aptitude are given relatively greater weight, the new areas contain three or four tests each and the tests of general aptitude are relatively more important than in the current aptitude areas. The new aptitude areas are more consistent with the demands of the modern Army training program than those developed previously.

Implementation of the new composites by DCSPER awaits resolution of certain operational problems in the areas of procurement, computerized assignment, and reception station processing. BESRL research personnel have worked closely with DCSPER and OPO to find solutions and will continue to provide any needed assistance.

Coincident with research on the revision of the aptitude areas, experimental classification tests were administered to the same group of 25,000 men. The tests are designed either to measure abilities not now measured by the ACB or to yield improved measures of abilities already covered by the ACB. Analysis of the tryout data will indicate which tests warrant operational use as part of the Army's classification procedure.

A new emphasis in differential classification is being pursued in research to determine how the effectiveness of the classification tests varies from situation to situation. The concern in the past has been to find tests that are better predictors in one occupational area, say mechanical, then in another, say clerical. In the new effort, the research question is how personal background and situational factors interact with test effectiveness. For example, how do changes in training courses affect the usefulness of the tests? How is the educational background of the men related to the effectiveness of the tests? Are the tests as effective for high school nongraduates and college graduates as they are for high school graduates?



## OPTIMUM MENTAL DISTRIBUTION

A new direction in initial classification is being pursued in research to determine the impact of lowered mental standards on Army effectiveness. The question is not whether the Army can use low ability men, but rather where and how such men may impair training and operational performance. The research goal is to determine what proportions of low ability men may be used without reducing operational capability below acceptable limits while maintaining tolerable costs.

This general problem has been recurrent with periods of military build-up; yet, the immediate priorities of a build-up have usually prevented adequate staffing of a study group and research has foundered during the period of retrenchment. The Army review of previous efforts, Marginal Man and Military Service<sup>1</sup>, documents this history of research started but never carried far enough to be useful in the next build-up. Therefore, the present work unit is using a broadly conceived research approach which will provide answers which should generalize well and apply to present and future situations.

## RESEARCH ACTIVITIES

In accord with the long view, plans have been made to proceed step-wise from one small unit type to another, establishing bench-marks across the range of unit types which get relatively large numbers of low ability men. In each bench-mark unit, the first objective is to develop small unit performance measures. Existing doctrine and Army procedures for evaluating training, readiness, and operations are used as far as possible, but special techniques of observation and data collection apart from operational reporting channels are expected to be necessary. While the performance of bench-mark units is being studied, the variation in ability mixtures from unit to unit is to be determined to see how abilities have been distributed by the personnel system under current policies. If the existing variation in ability mix between units is not great enough, it may be necessary to create units with ability mixes that differ greatly from those produced by current policies. The relations between ability mixtures and unit performance are expected to vary with many situational and leadership variables; hence, multivariate analysis is required with several hundred observations per unit type.

Certain kinds of individual performance, however, will not require the small military unit as the unit of observation. In particular, discipline or general adjustment to military life may be studied over a wide range of individuals without immediate regard for the particular unit of assignment. Finally, the impact of any given disciplinary offense will be felt in some small units, of course, but disciplinary offenses or general ineffectiveness may be viewed as general problems over a range of MOS and units.

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<sup>1</sup> Published by the Department of the Army, December 1965.

## RESEARCH PROGRESS

The impact of lowered standards on discipline was studied first because of official interest. A DOD interest in identifying men as early disciplinary risks led to the experimental use of a background and attitude questionnaire to evaluate its effectiveness in predicting disciplinary action. While it was shown that early offenders in Basic Combat Training and Advanced Individual Training tended to differ from other enlisted men in being high school dropouts, job "drifters," gang members, there were too many non-offenders with similar background characteristics and attitudes to use such information for personnel actions.

A Chief of Staff interest in the relation of enlistment standards to stockade input led to a comparison study of new prisoners and first tour soldiers. Very young men, just meeting minimum age standards, and high school dropouts were found to be highly over-represented among prisoners; AFQT Category IV men and Regular Army men were also over-represented, although to a lesser degree. The combination of minimum age and failure to graduate from high school accounted for 15 percent of stockade prisoners under approved sentences while making up only 4 percent of first tour soldiers. A system analysis approach to trace out the policy implications of this finding and related analyses is under consideration.

Active research on small unit performance began in 1968. Plans are to begin work in rifle squads and motor maintenance sections with the aim of establishing bench-marks in both combat and non-combat areas. The activation of the 4th Brigade, 82d Airborne Division was used to conduct a field study of rifle squads; Basic Unit training was observed and data were collected from August to December 1968. With observers on the ground to collect performance evaluations, the Army Training Tests yielded reliable squad measures over a wide range of situations and raters. Squad performance was positively related to AFQT score and rank of squad leaders. Variations in ability mix from squad to squad were not large enough to provide stable differences in squad performance within the 4th Brigade. Further studies using a direct field observation method for other kinds of rifle squads and for motor maintenance sections have been planned. Contract research proposals have been sought for the motor maintenance studies and work should begin in the near future.